

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent application of:

Applicant(s): David Alexander Gaukroger
Serial No: 10/561,495
Filing Date: December 19, 2005
Title: INSPECTION SYSTEM FOR AND METHOD OF INSPECTING
DEPOSITS PRINTED ON WORK PIECES
Examiner: Eric Rush
Art Unit: 2624
Docket No. FRYHP0137US

REPLY BRIEF

Mail Stop Appeal Brief Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is submitted in response to the Examiner's Answer dated April 26, 2010. In the event any fee or additional fee is necessary, the Commissioner is authorized to charge those fees to our Deposit Account No. 18-0988 under Docket No. FRYHP0137US.

A. Claims 1, 2, 6, 9, 23-25, 29 and 32 are rejected under 35 U.S.C. § 102(b) as being anticipated by Schanz.

The Examiner's response to applicant's arguments has been carefully reviewed.

Based on the Examiner's comments, it appears that a threshold issue exists that should first be decided. That is, what does certain language in the claims mean? The language at issue is "process the images to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece, as defined by a corresponding plurality of points, is of deposit."

Respecting arguments presented in applicant's main brief, the Examiner contends that nowhere in the claims is there a limitation corresponding to "referencing points in the image of the workpiece *only where the corresponding points in the image of the printing screen are determined to be of aperture and not for all points in the image of the printing screen...*" Examiner's Answer, page 18. The Examiner is correct that the quoted language does not appear in the claims, but the quoted language is fully consistent with the claims.

The language of claim 1 is clear that the control unit processes the image by determining, in turn, for each of a plurality of points whether the point is of aperture, and if the point is of aperture, determine if the corresponding point is of deposit. It follows from this that only where a point in the image of the printing screen is determined to be of aperture is a determination made as to whether the corresponding point in the corresponding image of the workpiece is of deposit. It also follows that if the determination is made in turn, for each of a plurality of points, then such a determination

is on a point-by-point basis. Therefore, the features to which applicant refers in the main brief are consistent with the claims.

The point-by-point approach of claim 1 clearly is not described or even hinted at by Schanz because Schanz requires the use of a reference pattern for image comparison. The Examiner in the Examiner's Answer at numerous places refers to when and how the reference pattern is determined. When and how the reference pattern is determined is irrelevant because Schanz requires the use of the reference pattern for comparison purposes and thus does not utilize anything akin to the point-by-point approach of claim 1. If the mode of operation of Schanz were, as alleged by the Examiner, that of capturing corresponding images of the printing stencil and the printed circuit board and then effecting a determination, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece is of deposit (i.e. a point-by-point determination of the captured images), there would be absolutely no need for the reference pattern.

The Examiner also contends that

Schanz states that "The image recording sensor 11 provides information - in pixel form - on the success of the application of solder paste to the printed circuit board 5." and "...the reference pattern of the printing stencil 3 is compared with the actual pattern, that is the solder paste application on the printed circuit board 5, whereby any defects can be identified.". The Examiner asserts that the comparison of Schanz between the information of the printing stencil and printed circuit board, in pixel form, implicitly determines whether a point is of aperture, and, where the point is of aperture, determines whether the corresponding point of the corresponding image of the workpiece (circuit board) is of deposit, this is taken to be because Schanz is able to detect any defects between the reference pattern of the stencil and the actual pattern of the solder paste application on the circuit board by a step of comparing.

Examiner's Answer, page 19.

The Examiner acknowledges that Schanz teaches a reference pattern that is compared to an actual pattern, but improperly contends that Schanz implicitly determines whether a point is of aperture, and, where the point is of aperture, determines whether the corresponding point of the corresponding image of the circuit board is of deposit. There is simply nothing in Schanz that would lead one to believe that Schanz is doing anything other than a direct comparison of the two patterns. The determination of whether a point is of deposit is not based on the corresponding point having previously been determined as being of aperture. All Schanz says about its comparison method is that "an assessment of the solder paste application is possible in the course of the inspection system in a particularly simple way, since it is merely necessary to carry out a comparison of the data of the reference pattern with the actual data." Col. 3, Ins. 24-28. Accordingly, Schanz does not disclose processing the images to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture, and, where the point is of aperture, determine whether the corresponding point of the corresponding image of the workpiece is of deposit.

The Examiner next contends that

On page 12 first paragraph of the brief filed 14 January 2010, the Appellant argues, with respect to claim 1, that the reference pattern of Schanz "manifestly cannot be a pixilated image". The Appellant alleges that reference pattern of Schanz is previously recorded in a teach-in method from a plurality of test patterns prior to initial use of the printing stencil. The Examiner respectfully disagrees. The Examiner asserts that the Appellant is referencing various different portions of the disclosure of Schanz which do not necessarily go together, as can be seen from the Appellants referencing of columns and lines from the "description of the related art", "brief summary of the invention" and "detailed description of

the invention" sections of Schanz. The Examiner asserts that Schanz does in fact teach that their reference pattern is a pixilated image, see Schanz column 6 lines 13 - 20. In the aforementioned sections Schanz states "said image recording sensor can consequently generate *in a pixel structure* a corresponding image of the structure, in particular the coordinates, shape and size of the stencil openings, of the printing stencil." The Examiner also asserts that the Appellant erred in their allegation that the reference pattern, the image of the printing stencil of Schanz is determined prior to initial use of the printing stencil. The Examiner asserts that Schanz teaches that their invention also relates to "an apparatus for generating test patterns *during the application* of solder paste to printed circuit boards ... ", see Schanz column 3 lines 30 - 34, and the Examiner also asserts that Schanz teaches that his inspection, and generating of reference and actual patterns, is done after the solder is applied, see Schanz column 5 lines 49 - 67.

Examiner's Answer, pages 19 and 20.

The Examiner took issue with applicant's statement that the reference pattern of Schanz is previously recorded in a teach-in method from a plurality of test patterns. It is respectfully submitted that the Examiner is not properly construing the reference. Although Schanz states that recording can take place after the solder paste has been applied, Schanz also states that "the recording takes place in the so-called teach-in method." Col. 6, ln. 24. Even if the Examiner is correct that the reference pattern can be obtained after the solder is applied, Schanz still discloses a comparison of the reference pattern to the actual pattern. In order to accomplish that, the two images necessarily must exist prior to the comparison being made. This is in stark contrast to the claimed point-by-point determination that does not require a reference pattern for comparison purposes in the manner taught by Schanz. One of the advantages of the point-by-point determination is the elimination of a need for a reference pattern, which can greatly simplify the analysis and speed up processing.

Additionally, the Examiner states that

Furthermore, the Examiner asserts that because both patterns are in fact pixilated images the step of comparing is in fact determining for a plurality of points (pixels) whether the point is of aperture and when it is of aperture if the corresponding point in the corresponding image is of deposit, again the Examiner asserts that this is implicit from the definition of comparing, and the step of comparing the reference pattern of the printing stencil with the actual pattern of the printed circuit board and is further evidenced by the notion of inspection with regards to the adequacy of the solder paste application.

Examiner's Answer, page 23 and 24.

The Examiner also took issue with applicant's statement that the reference pattern is not a pixilated image. According to the Examiner, both patterns are in fact pixilated images. Applicant disagrees. But even if the Examiner were correct, there is no teaching to look in turn, at each pixel, to see if it corresponds to aperture and then determine if the pixel is of deposit. Therefore, although Schanz does compare the images, the direct comparison of the images is not what is recited in claim 1.

Finally, on page 24 of the Examiner's Answer, regarding claim 1 the Examiner states that

On page 14 second paragraph of the brief filed 14 January 2010, with respect to claim 1, the Appellant argues that the claims of Schanz "provide further proof that Schanz does not disclose and did not intent to process the image to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture.". The Examiner asserts that again the Appellant is referencing various portions of Schanz's disclosure which do not necessarily go together. The Examiner asserts that the disclosure of Schanz *in its entirety* is being applied as art against the instant claim and asserts that more often than not prior art disclosures disclose multiple embodiments, variations and modifications which do not exclude any other teachings disclosed in the reference(s). The Examiner asserts that the sections cited by the Appellant were not and are not relied upon to teach claim 1 (or 24) and asserts that the teachings of the detailed description of the invention was and is relied upon. Furthermore, the Examiner asserts that the claims of

Schanz do not obviate any other teachings, disclosure and/or suggestions made by Schanz.

Specifically, the Examiner states that the claims of Schanz do not obviate any other teachings, disclosure and/or suggestions made by Schanz. Nowhere has applicant contended that the claims of Schanz obviate any other teaching in Schanz. As noted in applicant's main brief, because Schanz does not clearly recite its method of comparing images, the claims were referenced to show that Schanz intended its comparison to be a direct comparison of production pattern data and reference pattern data to determine conformity of an actual pattern of an application of solder paste to a desired pattern of application (col. 7, Ins. 8-12). Accordingly, the claims provide further proof that Schanz does not disclose and did not intend to process the images to determine, in turn, for each of a plurality of points defining the image of the printing screen, whether the point is of aperture.

Therefore, for the foregoing reasons, Schanz does not teach or suggest the subject matter of claim 1 and the rejection should be reversed. And, for at least the same reasons discussed with respect to claim 1, Schanz does not teach or suggest the subject matter of claim 24 and the rejection should be reversed.

Regarding claim 2, the Examiner contends that Schanz discloses that the two optoelectronic devices are operable simultaneously to capture images of the printing screen and the workpiece. There is simply no disclosure in Schanz, however, that the image sensors simultaneously capture images of the printing screen and the workpiece. Accordingly for this reason, and the reasons discussed above regarding claim 1, Schanz does not teach or suggest the subject matter of claim 2. For at least the same reasons, Schanz does not teach or suggest the subject matter of claim 25.

B. Claims 3, 5, 26 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schanz.

Regarding claim 5, there is no disclosure in Schanz that the images are taken simultaneously. Further, there is no disclosure in Schanz that the control unit is configured simultaneously to process the images of the printing screen and the workpiece during image capture by the camera unit. The Examiner concedes this by saying that he was not simply relying on Schanz, but also on Official Notice. The Examiner took Official Notice that a control unit could be configured to simultaneously process the images of the printing screen and the workpiece during image capture by the camera unit.

Applicant agrees that a control unit could be configured to simultaneously process images during image capture, but this does not change the fact that Schanz does not teach simultaneous capture and processing of images. As best can be determined by Schanz, Schanz obtains the entire reference image before undergoing any comparison and there is nothing in the reference indicating otherwise. In fact, Schanz discloses that after the image recording sensor provides information on the success of the application of solder paste to the printed circuit board,

[I]t is then possible by means of the data processing electronics to evaluate the information of the two image recording sensors 11 and 12, that is to say that the reference pattern of the printing stencil 3 is compared with the actual pattern, that is the solder paste application on the printed circuit board 5, whereby any defects can be identified."

Schanz, col. 6, Ins. 38-44, emphasis added.

Again, if Schanz were simultaneously capturing and processing the image using a point-by-point determination, there would be no need for the reference pattern. Accordingly, for at least the foregoing reasons, Schanz does not teach or suggest the

subject matter of claim 5. For at least the same reasons, Schanz does not teach or suggest the subject matter of claim 28.

C. Claims 4, 7, 10-22, 27, 30, and 33-45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schanz in view of MacFarlane.

Regarding claim 16, the Examiner contends that the description in MacFarlane implicitly gives a representation of a worst case scenario. Applicant respectfully disagrees, however, even if this were true, there is completely lacking any suggestion that the logical determination of MacFarlane could somehow be utilized in the comparison of Schanz. Accordingly, the combination of Schanz and MacFarlane does not teach or suggest the subject matter of claim 16. For at least similar reasons, Schanz does not teach or suggest the subject matter of claims 18, 39 and 41.

Conclusion

In view of the foregoing, it is respectfully submitted that the claims are patentable over the applied art and that the rejections advance by the Examiner should be reversed.

Respectfully submitted,

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